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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/579,798	05/18/2006	Hiroshi Yaguchi	290237US0PCT	3478

22850 7590 06/27/2008  
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C.  
1940 DUKE STREET  
ALEXANDRIA, VA 22314

EXAMINER
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FOGARTY, CAITLIN ANNE

ART UNIT	PAPER NUMBER
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1793

NOTIFICATION DATE	DELIVERY MODE
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06/27/2008

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/579,798	<b>Applicant(s)</b> YAGUCHI ET AL.	
	<b>Examiner</b> CAITLIN FOGARTY	<b>Art Unit</b> 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 18 May 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 May 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>5/18/2006, 6/12/2007, 7/23/2007</u> .                         | 6) <input type="checkbox"/> Other: _____                          |



## **DETAILED ACTION**

### ***Status of Claims***

1. Claims 1 – 20 are pending and presented for this examination.

### ***Priority***

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Information Disclosure Statement***

3. The information disclosure statements (IDS) were submitted on May 18, 2006, June 12, 2007, and July 23, 2007. These submissions are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statements are being considered by the examiner.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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6. Claims 1 – 4, 6 – 9, 13 – 15, and 17 – 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over the English machine translation of JP 2003-253390 from the IDS (JP '390).

With respect to instant claim 1, the abstract, [0005]-[0007] and [0026] disclose a low-carbon sulfur-based free machining steel product excellent in finished surface roughness with a clearly overlapping composition as seen in Table 1 below.

**Table 1**

<b>Element</b>	<b>Instant Claim 1 (mass%)</b>	<b>JP '390 (mass %)</b>	<b>Overlapping Range (mass%)</b>
C	0.02 – 0.12	0.02 – 0.15	0.02 – 0.12
Si	≤ 0.01	≤ 0.01	≤ 0.01
Mn	1.0 – 2.0	0.50 – 2.0	1.0 – 2.0
P	0.05 – 0.20	0.05 – 0.20	0.05 – 0.20
S	0.30 – 0.60	0.15 – 0.50	0.30 – 0.50
N	0.007 – 0.03	0.002 – 0.02	0.007 – 0.02
Fe + impurities	Balance	Balance	Balance

JP '390 also teaches that the average width (μm) of sulfide inclusions in the steel product is  $2.8 \cdot \log(d)$  or more where d is the diameter (mm) of the steel product ([0005]). Furthermore, paragraph [0033] of JP '390 teaches that the steel product has a ferrite-pearlite structure as its metallographic structure.

JP '390 does not specifically teach that the contents of Mn and S satisfy the recited formulas in instant claim 1. However, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, *In re Cooper and Foley* 1943 C.D. 357, 553 O.G. 177; 57 USPQ 117, *Taklatwalla v. Marburg*, 620 O.G. 685, 1949 C.D. 77, and *In re Pilling*, 403 O.G. 513, 44 F(2) 878, 1931 C.D. 75. In the absence of evidence to the contrary, the selection of the

proportions of elements would appear to require no more than routine investigation by those ordinary skilled in the art. *In re Austin, et al.*, 149 USPQ 685, 688.

JP '390 does not specifically teach that the hardness HV of pro-eutectoid ferrite in the metallographic structure is 133 to 150. However, paragraph [0033] of JP '390 teaches that the metallographic structure contains pro-eutectoid ferrite. It would be expected that the free machining steel of JP '390 would have the same pro-eutectoid ferrite hardness in the metallographic structure as that of the instant application because a similar process is used to make the free machining steel of JP '390 (see paragraph [0007] of JP '390).

In regards to instant claim 2, the abstract, [0005]-[0007] and [0026] disclose a low-carbon sulfur-based free machining steel product excellent in finished surface roughness with a clearly overlapping composition as seen in Table 1 above. JP '390 also teaches that the average width ( $\mu\text{m}$ ) of sulfide inclusions in the steel product is  $2.8 \cdot \log(d)$  or more where  $d$  is the diameter (mm) of the steel product ([0005]). Furthermore, paragraph [0033] of JP '390 teaches that the steel product has a ferrite-pearlite structure as its metallographic structure.

JP '390 does not specifically teach that the contents of Mn and S satisfy the recited formulas in instant claim 2. However, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, *In re Cooper and Foley* 1943 C.D. 357, 553 O.G. 177; 57 USPQ 117, *Taklatwalla v. Marburg*, 620 O.G. 685, 1949 C.D. 77, and *In re Pilling*, 403 O.G. 513, 44 F(2) 878, 1931 C.D. 75. In the absence of evidence to the contrary, the selection of the

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proportions of elements would appear to require no more than routine investigation by those ordinary skilled in the art. *In re Austin, et al.*, 149 USPQ 685, 688.

JP '390 does not specifically teach that the difference in deformation resistance at a strain of 0.3 between 200°C and 25°C is 110 MPa or more and 200 MPa or less, the deformation resistances being determined at a deformation rate of 0.3 mm/min in a compression test. However, a similar process is used to make the free machining steel of JP '390 (see paragraph [0007] of JP '390) and the steel of the instant application. Therefore, it would be expected that the free machining steel of JP '390 would have the same deformation resistance.

Regarding instant claims 3 and 7, JP '390 does not specifically teach that the steel product further comprises 70 ppm or more of dissolved nitrogen. However, since the composition of nitrogen in the steel of JP '390 overlaps with that of the instant invention and a similar process is used to make each steel, it would be expected that the steel of JP '390 would contain an overlapping amount of dissolved nitrogen with the steel of the instant invention.

With respect to instant claims 4, 8, and 9, paragraph [0005] of JP '390 teaches that the steel comprises 0.01 mass% or less aluminum which is within the range recited in instant claim 4. JP '390 does not teach that the steel comprises Cr and therefore the steel of JP '390 satisfies the claim limitation of not more than 0.04 mass% Cr.

Since the claimed compositional ranges of claims 1-4 and 7-9 either overlap or are within the ranges disclosed by JP '390, a prima facie case of obviousness exists. See MPEP 2144.05. It would have been obvious to one of ordinary skill in the art at the

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time the invention was made to select the claimed free machining steel alloy composition from the free machining steel alloy composition disclosed by JP '390 because JP '390 teaches the same utility (i.e. free machining steel wire rod) in the whole disclosed range.

In regards to instant claims 6 and 13 – 15, paragraphs [0005] and [0020] of JP '390 teach that the steel is cast. JP '390 does not specifically teach that before casting, the free oxygen (Of) is controlled to a content of 30 ppm or more and less than 100 ppm and the ratio Of/S of Of to S is controlled to within a range from 0.005 to 0.030, Of and S being contained in the molten steel before casting. However, paragraphs [0005], [0011], and [0014] of JP '390 disclose that the content of S in the steel is 0.15 - 0.50 mass% and the content of O in the steel is 0.01 - 0.03 mass%. The compositional ranges of S and O overlap with the compositional ranges recited in the instant application. Since the compositional ranges of S and O overlap, it would be expected that the ratio of free oxygen to sulfur of JP '390 would overlap with that of the instant invention.

Regarding instant claims 17 – 20, paragraphs [0001] and [0002] of JP '390 teach that the steel product may be in the form of a nipple, screw, or wire rod. JP '390 does not specifically teach that the steel product may be in the form of a steel bar. However, claims 17 – 20 recite intended uses of the product and an intended use is not considered a limitation and is of no significance to the claim construction. See MPEP 2111.02 II.



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7. Claims 1 – 5, 7 – 12, and 17 – 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over the English machine translation of JP 2001-207240 from the IDS (JP '240).

With respect to instant claim 1, the abstract and [0007]-[0009] of JP '240 disclose a low-carbon resulfurized free machining steel product with a clearly overlapping composition as seen in Table 2 below.

Table 2

Element	Instant Claim 1 (mass%)	JP '240 (mass %)	Overlapping Range (mass%)
C	0.02 – 0.12	$0 < C < 0.15$	0.02 – 0.12
Si	$\leq 0.01$	$\leq 0.05$	$\leq 0.01$
Mn	1.0 – 2.0	0.3 – 2	1.0 – 2.0
P	0.05 – 0.20	$\leq 0.2$	0.05 – 0.20
S	0.30 – 0.60	0.08 – 0.5	0.30 – 0.50
N	0.007 – 0.03	$\leq 0.01$	0.007 – 0.01
Fe + impurities	Balance	Balance	Balance

JP '240 does not teach that the contents of Mn and S satisfy the recited formulas in instant claim 1. However, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, *In re Cooper and Foley* 1943 C.D. 357, 553 O.G. 177; 57 USPQ 117, *Taklatwalla v. Marburg*, 620 O.G. 685, 1949 C.D. 77, and *In re Pilling*, 403 O.G. 513, 44 F(2) 878, 1931 C.D. 75. In the absence of evidence to the contrary, the selection of the proportions of elements would appear to require no more than routine investigation by those ordinary skilled in the art. *In re Austin, et al.*, 149 USPQ 685, 688.

JP '240 differs from instant claim 1 because it does not teach that the steel product has excellent finished surface roughness or a ferrite-pearlite structure as its metallographic structure, wherein the average width ( $\mu\text{m}$ ) of sulfide inclusion in the steel

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product is  $2.8 \cdot \log(d)$  or more, wherein  $d$  is the diameter (mm) of the steel product, and pro-eutectoid ferrite in the metallographic structure has a hardness HV of 133 to 150. However, the steel product of JP '240 is made using a similar method to that of the instant application (see [0036]-[0038]) and therefore would be expected to have the same microstructure and characteristics since the compositions overlap.

In regards to instant claim 2, the abstract and [0007]-[0009] of JP '240 disclose a low-carbon resulfurized free machining steel product with a clearly overlapping composition as seen in Table 2 above.

JP '240 does not specifically teach that the contents of Mn and S satisfy the recited formulas in instant claim 2. However, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, *In re Cooper and Foley* 1943 C.D. 357, 553 O.G. 177; 57 USPQ 117, *Taklatwalla v. Marburg*, 620 O.G. 685, 1949 C.D. 77, and *In re Pilling*, 403 O.G. 513, 44 F(2) 878, 1931 C.D. 75. In the absence of evidence to the contrary, the selection of the proportions of elements would appear to require no more than routine investigation by those ordinary skilled in the art. *In re Austin, et al.*, 149 USPQ 685, 688.

JP '240 does not specifically teach that the steel product has excellent finished surface roughness or a ferrite-pearlite structure as its metallographic structure, wherein the average width ( $\mu\text{m}$ ) of sulfide inclusion in the steel product is  $2.8 \cdot \log(d)$  or more, wherein  $d$  is the diameter (mm) of the steel product, and the difference in deformation resistance at a strain of 0.3 between 200°C and 25°C is 110 MPa or more and 200 MPa or less, the deformation resistances being determined at a deformation rate of 0.3

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mm/min in a compression test. However, the steel product of JP '240 is made using a similar method to that of the instant application and therefore would be expected to have the same microstructure, characteristics, and deformation resistance since the compositions overlap.

Regarding instant claims 3 and 7, paragraph [0018] of JP '240 teaches that the steel product comprises 0.01 mass% or less dissolved nitrogen which is within the range recited in instant claims 3 and 7.

With respect to instant claims 4, 5, and 8 – 12, paragraphs [0007]-[0009] and [0034] of JP '240 teach that the steel comprises 1 mass % or less Cr, Ni, V, Ti, and Nb and 0.05 mass% or less aluminum which are either within or overlap the ranges recited in instant claims 4, 5, and 8 – 12.

Since the claimed compositional ranges of claims 1-5 and 7-12 either overlap or are within the ranges disclosed by JP '240, a prima facie case of obviousness exists. See MPEP 2144.05. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the claimed free machining steel alloy composition from the steel alloy composition disclosed by JP '240 because JP '240 teaches the same utility (i.e. steel wire rod) in the whole disclosed range.

Regarding instant claims 17 – 20, paragraph [0001] of JP '240 teaches that the steel product may be in the form of a wire rod or a steel bar. JP '240 does not specifically teach that the steel product may be in the form of a nipple or screw. However, claims 17 – 20 recite intended uses of the product and an intended use is not

considered a limitation and is of no significance to the claim construction. See MPEP 2111.02 II.

8. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over the English machine translation of JP 2001-207240 from the IDS (JP '240) as applied to claims 1 and 5 above, and further in view of the English machine translation of JP 2003-253390 from the IDS (JP '390).

JP '240 is applied to claims 1 and 5 as discussed in the rejection above.

JP '240 differs from instant claim 16 because it does not teach that before casting the steel, the free oxygen (Of) is controlled to a content of 30 ppm or more and less than 100 ppm and the ratio Of/S of Of to S is controlled to within a range from 0.005 to 0.030, Of and S being contained in molten steel before casting.

However, the abstract, [0005]-[0007] and [0026] of JP '390 disclose a low-carbon sulfur-based free machining steel product excellent in finished surface roughness with an overlapping composition with the steel of JP '240. Furthermore, paragraphs [0005] and [0020] of JP '390 teach that the steel is cast. JP '390 does not specifically teach that before casting, the free oxygen (Of) is controlled to a content of 30 ppm or more and less than 100 ppm and the ratio Of/S of Of to S is controlled to within a range from 0.005 to 0.030, Of and S being contained in the molten steel before casting. However, paragraphs [0005], [0011], and [0014] of JP '390 disclose that the content of S in the steel is 0.15 - 0.50 mass% and the content of O in the steel is 0.01 - 0.03 mass%. The compositional ranges of S and O overlap with the compositional ranges recited in the instant application. Since the compositional ranges of S and O overlap, it would be

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expected that the ratio of free oxygen to sulfur of JP '390 would overlap with that of the instant invention. It would have been obvious to one of ordinary skill in the art to use the method of casting with specific O and S concentrations as disclosed in JP '390 as an alternate method to make the steel of JP '240 because the final products have very similar and overlapping compositions.

### ***Conclusion***

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CAITLIN FOGARTY whose telephone number is (571)270-3589. The examiner can normally be reached on Monday - Friday 8:00 AM - 5:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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